

IN THE DRAWING FIGURES:

Kindly substitute Figures 1-18 of the above-identified application with the enclosed seven (7) sheets of formal drawings of Figures 1-18, each sheet marked "REPLACEMENT SHEET".

REMARKS

Reconsideration and allowance of the above-identified application are respectfully requested.

Claims 1-110 are currently pending. Claims 1, 12, 24, 37, 48, 61, 74, 85 and 98 are independent. Claims 48, 74 and 85 have been amended merely to clarify the language of these claims. No new matter has been introduced by way of these amendments.

Applicant notes with appreciation the acknowledgment by the Patent Office of the Information Disclosure Statements submitted on August 28, 2001, October 16, 2001, and July 23, 2002.

Applicant would like to thank Examiner Eugene Yun for the personal interview conducted on May 19, 2005. In compliance with M.P.E.P. § 713.04, the substance of that interview is incorporated in the following remarks.

Applicant notes that the Patent Office has objected to the drawings filed on August 1, 2001. However, the Patent Office has failed to indicate any ground of objection in the Office Action regarding the drawings. During the interview, the Patent Office clarified its position. The Patent Office noted that it found informal drawings in the Patent Office records for the present application. It was respectfully noted to the Patent Office that Patent Office records clearly indicate that seven (7) sheets of formal drawings for the present application were filed on October 31, 2001, in response to a Notice to File Corrected Application Papers. However, merely for the convenience of the Patent Office, Applicant hereby submits seven (7) sheets of formal drawings for Figures 1-18 in connection with the above-identified application, each sheet marked "REPLACEMENT SHEET." Should the enclosed drawings require changes, it is respectfully requested that the Patent Office notify the undersigned of same. Accordingly,

reconsideration and withdrawal of any supposed grounds of objection are respectfully requested.

In the second section of the Office Action, claims 1, 12, 24, 37, 48, 61, 74, 85 and 98 are rejected under the judicially created doctrine of obviousness-type double patenting, as allegedly being unpatentable over claims 1 and 7 of U.S. Patent No. 6,775,529 in view of Patel et al. (U.S. Patent No. 5,175,764, hereinafter "Patel"). Applicant hereby submits a terminal disclaimer in compliance with 37 C.F.R. 1.321(c) to overcome the present non-statutory double patenting rejection. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

During the interview, the rejection of claims 1-110 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Dankberg et al. (U.S. Patent No. 5,596,439, hereinafter "Dankberg") in view of Patel was discussed. No agreement was reached. This rejection is respectfully traversed.

Among other features, independent claims 1, 12, 24, 37, 48, 61, 74, 85 and 98 recite the features of a replica transmission signal, a composite signal that includes a transmission signal component and a receive signal component, and producing a receive signal as a difference between the composite signal and the replica transmission signal. The aforementioned claims also recite the feature of controlling the magnitude of the composite signal by controlling a common-mode shift current.

As illustrated in Figure 5 of the present application, a transmitter 1 can include a current source I_{TX} and a resistor R_{TX} to generate a transmit signal voltage V_{TX} equal to $I_{TX}R_{TX}$. If the power supply voltage source for the circuit is less than the maximum voltage that could be present across resistor R_{TX} , then improper operation or damage can result.

Accordingly, the common-mode shift current control circuitry according to the present invention can control the amount of current being drawn across resistor R_{TX} so as to keep the composite voltage signal within an appropriate operating range.

For example, as illustrated in Figure 15 of the present application, by controlling V_O , the common-mode shift current flowing through the resistors R_1 can be controlled. By controlling the common-mode shift current, V_{TX} is thereby also controlled. By controlling V_{TX} , the situation in which V_{TX} exceeds an operating parameter of the circuit, such as, for example, the power supply voltage source, is avoided. For example, it is undesirable for the composite voltage signal to exceed the supplied voltage for the circuit.

Additionally, independent claims 12 and 24 recite the feature of an active resistive summing circuit that produces a receive signal as a difference between the composite signal and the replica transmission signal. The active resistive summing circuit can provide a large input dynamic range and stable linearity characteristics, while removing (e.g., reducing or canceling) the unwanted transmit signal component from the receive signal.

As understood by Applicant, Dankberg is directed to a source transmitted signal that is cancelled at the receiver associated with the transmitter, so that the desired received signal can be extracted from a composite received signal. The composite received signal consists of the source signal relayed from a relay station along with the desired received signal from the other user in the pair, plus additive noise. According to Dankberg, the invention takes advantage of the fact that each of the users knows *a priori* the exact structure of its source transmitted signal and can estimate the channel characteristics between the relay station and itself. [see Dankberg, Abstract] As understood by Applicant, Dankberg includes an interference canceller 112. The interference canceller 112 has five elements: a variable delay

element 20 for storing a representation of the source signal, a modulator/mixer element 22, a programmable gain element 24, a subtractor 26, and a parameter estimation element 28. [*see* Dankberg, column 4, lines 35-38; column 4, line 55-column 5, line 16]

It is respectfully submitted, however, that *nowhere* does Dankberg disclose or even suggest a common-mode shift current, nor does Dankberg mention or recognize the problem of common-mode shift. In particular, as acknowledged by the Patent Office, Dankberg does not disclose or suggest the features of a first sub-circuit that includes a third input that receives a **common-mode shift current**, and does not disclose or suggest a second sub-circuit **for controlling the common-mode shift current**, so that the magnitude of a composite signal does not exceed a predetermined value of an operating parameter of an electrical circuit. [*see* Office Action, page 5]

Additionally, it is respectfully submitted that *nowhere* does Dankberg disclose or even suggest the feature of an active resistive summing circuit, as recited in, for example, independent claims 12 and 24 of the present application.

As understood by Applicant, Patel is directed to an enhanced high voltage line interface circuit for a digital switching system over which a connection is established between a digital switching system and a subscriber instrument via a subscriber loop. [*see* Patel, Abstract] According to Patel, a common-mode sensing circuit is connected to the tip and the ring leads of a subscriber loop and to tip drive and the ring drive amplifier circuits. [*see* Patel, column 2, lines 44-46] More particularly, “[t]he common-mode sensing circuit is arranged to sense the voltage dropped across the subscriber loop and to output a control voltage to the tip drive and ring drive amplifier circuits, for controlling the tip feed current and the ring feed current produced by the tip drive [and] ring drive amplifier circuits,

respectively.” [Patel, column 2, lines 46-52] Furthermore, according to Patel, a line-sensing circuit “ is arranged to generate a logic output that signals a system controller that a current is flowing in the tip lead of the subscriber loop.” [Patel, column 3, lines 18-21] Additionally, “[w]hen either the tip lead or the ring lead protection circuit output voltage exceeds a preset threshold, the line sensing circuit generates a logic signal output that signals to a system controller that an overcurrent condition exists in the subscriber loop.” [Patel, column 3, lines 24-29]

It is respectfully submitted, however, that *nowhere* does Patel disclose or suggest the features of a replica transmission signal, and producing a receive signal as a difference between the composite signal and the replica transmission signal. Additionally, it is respectfully submitted that *nowhere* does Patel disclose or even suggest the feature of an active resistive summing circuit, as recited in, for example, independent claims 12 and 24 of the present application.

To overcome such deficiencies, the Patent Office attempts to combine Dankberg with Patel. According to established mandates of the patent laws, “[t]o establish a prima facie case of obviousness . . . there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” [M.P.E.P. § 2142] “There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” [M.P.E.P. § 2143.01] “The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved.” [*In re Kotzab*, 217 F.3d 1365, 1370, 55

U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000)] The showing must be “clear and particular, and it must be supported by **actual evidence**.” [*Teleflex, Inc. v. Ficosa North American Corp.*, 299 F.3d 1313, 1334, 63 U.S.P.Q.2d 1374, 1387 (Fed. Cir. 2002) (quoting *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999)) (emphasis added)] It is not sufficient to rely on “common sense and common knowledge,” as there must be specific evidence to support the motivation. [*See In re Lee*, 277 F.3d. 1338, 1344-45, 61 U.S.P.Q.2d 1430, 1434-35 (Fed. Cir. 2002)]

It is respectfully submitted the Patent Office has provided absolutely no reference, citation or other **actual evidence**, in Dankberg, Patel or otherwise, for the bald and unsupported assertion that the proposed modification of Dankberg with the teachings of Patel “would have been obvious to one of ordinary skill in the art at the time the invention was made . . . in order to better prevent the use of excessive amounts of power.” [Office Action, page 5] Furthermore, as noted previously, the Patent Office has acknowledged that *nowhere* does Dankberg recognize or even discuss a common-mode shift current, or disclose or recognize the problem of common-mode shift. Given such an utter lack of teaching or suggestion, the Patent Office has provided no support or actual evidence as to why Dankberg would want to control a common-mode shift current as described in Patel. In addition, neither Dankberg nor Patel disclose or even suggest the feature of an active resistive summing circuit, as recited in, for example, independent claims 12 and 24.

It is respectfully submitted that the Patent Office has failed to establish a *prima facie* case of obviousness with respect to independent claims 1, 12, 24, 37, 48, 61, 74, 85 and 98. If this rejection is repeated, the Patent Office is requested to specifically provide a reference, point out a citation, or provide other actual evidence for such bald and unfounded assertions.

Rather, it is respectfully submitted that the Patent Office is using impermissible hindsight in an attempt to render the claims of the present application obvious. According to M.P.E.P. § 2142, “[t]o reach a proper determination under 35 U.S.C. 103, . . . impermissible hindsight must be avoided and the legal conclusion [of obviousness] must be reached on the basis of the facts gleaned from the prior art.” Furthermore, according to M.P.E.P. § 2143.01, “[t]he mere fact that references can be . . . modified does not render the resultant combination obvious unless the prior art also suggests the desirability of [such modification].” [citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990)]

It is respectfully submitted that it is clearly evident from the Patent Office's purported motivation to combine the references that the Patent Office is using the Applicant's own specification as a “road map” to reconstruct the Applicant's own invention. Additionally, since the Patent Office has offered no proper support or motivation for combining the Dankberg and Patel references, it is respectfully submitted that the rejection based on obviousness is wholly and completely founded upon “knowledge gleaned only from applicant's disclosure.” [see M.P.E.P. § 2145] Consequently, it is respectfully submitted that the rejection entails hindsight and is, therefore, improper.

Furthermore, as noted previously, independent claims 12 and 24 recite the feature of an active resistive summing circuit. *Even if* the Dankberg and Patel references could be combined (which Applicant does not admit), it is respectfully submitted that neither Dankberg nor Patel disclose or even suggest the feature of an active resistive summing circuit. It is respectfully noted that the Patent Office has failed to point out, either in the present Office Action or during the interview, where either Dankberg or Patel discloses or even suggests such a feature. For example, *no* cite or reference to either Dankberg or Patel

has been made by the Patent Office in the present Office Action specifically pointing out where either Dankberg or Patel discloses an active resistive summing circuit. [*see, e.g.*, Office Action, page 5] Accordingly, it is respectfully submitted that independent claims 12 and 24 are further allowable for this additional reason. If the Patent Office maintains the present rejection in the next Office Action, Applicant respectfully requests that the Patent Office specifically point out where an active resistive summing circuit is supposedly disclosed by either Dankberg or Patel.


For at least the foregoing reasons, it is respectfully submitted that the combination of Dankberg and Patel does not render the subject matter of independent claims 1, 12, 24, 37, 48, 61, 74, 85 and 98 obvious.

Dependent claims 2-11, 13-23, 25-36, 38-47, 49-60, 62-73, 75-84, 86-97 and 99-110 variously depend from independent claims 1, 12, 24, 37, 48, 61, 74, 85 and 98, and are, therefore, patentably distinguishable over the combination of Dankberg and Patel for least those reasons stated above with regard to claim 1, 12, 24, 37, 48, 61, 74, 85 and 98.

For at least the foregoing reasons, it is respectfully submitted that the combination of Dankberg and Patel does not render the subject matter of claims 1-110 obvious. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

All of the objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance and a notice to that effect is earnestly solicited. Should the Examiner have any questions regarding this response or the application in general, the Examiner is urged to contact the Applicant's attorney, Andrew J. Bateman, by telephone at (202) 625-3547. All correspondence should continue to be directed to the address given below.

Respectfully submitted,

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